

## Claims

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3 1. Piezoelectric actuator having

4 - a piezoelectric element (2; 21) for actuating a mechanical component with

5 - a pulling or pushing force, and a compensating element (3; 22), wherein

6 - the piezoelectric element (2) and the compensating element (3; 22)

7 - basically have the same temperature expansion coefficients, and wherein

8 - the compensating element (3; 22) is mechanically coupled to the

9 - piezoelectric element (2; 21) in such a fashion that the temperature-

10 induced expansions of the piezoelectric element (2; 21) and the

11 compensating element (3; 22) cancel each other out in the effective

12 direction in such a fashion that the actuating element remains in its

13 position.

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15 2. Piezoelectric actuator according to claim 1, characterized in that

16 - a heat transfer compound (12) is located between the piezoelectric

17 element (2; 21) and the compensating element (3; 22).

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19 3. Piezoelectric actuator according to claim 1, characterized in that

20 - the piezoelectric element (2; 21) is supported on one end on a fixed

21 support plate (9), which fixed support plate (9) bears against the housing

22 (7) for the piezoelectric actuator (1; 20) via a spring (10) and which is

23 connected at the other end to a pretensioning spring (6; 23) via a pressing

24 plate (11; 24), which pretensioning spring (6; 23), in turn, is held against

25 the fixed support plate (9) with its other end, and that

26 - the compensating element (3; 22) basically lies parallel to the piezoelectric

27 element (2; 21) and is also held against the fixed support plate (9) with

28 one end and solidly abuts the housing (7) with the other end.

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30 4. Piezoelectric actuator according to claim 3, characterized in that

1 - the pretensioning spring (6) and the piezoelectric element (2) are located  
2 in tandem.

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4 5. Piezoelectric actuator according to claim 4, characterized in that  
5 - the movable end of the piezoelectric element (2) is connected to the  
6 pressing plate (5) via a tightening strap (8).

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8 6. Piezoelectric actuator according to claim 3, characterized in that  
9 - the pretensioning spring (23) and the piezoelectric element (21) are  
10 situated parallel to each other.

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12 7. Piezoelectric actuator according to claim 1, characterized in that  
13 - the pretensioning spring is formed out of at least one zigzag spring (6; 23).

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15 8. Piezoelectric actuator according to claim 1, characterized in that  
16 - the piezoelectric element (2; 21) is composed of a multilayer structure of  
17 transversely arranged, ceramic piezoelectric plies that become longer in  
18 the effective direction when an external electric voltage is applied, and the  
19 compensating element (3; 22) is made of ceramic.

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21 9. Piezoelectric actuator according to claim 1, characterized in that  
22 - the piezoelectric element (2, 21) is composed of a multilayer structure of  
23 transversely arranged, ceramic piezoelectric plies that become longer in  
24 the effective direction when an external electric voltage is applied, and that  
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26 - the compensating element (3; 22) is composed of piezoelectric plies  
27 arranged in the longitudinal direction that become shorter in the effective  
28 direction when an external electric voltage is applied.

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